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(54) **SEMICONDUCTOR LASER HIGHPOWER AMPLIFIER SYSTEM**

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(58) Field of Search **372/6; 359/179, 359/341**

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(57) **ABSTRACT**

A high power laser optical amplifier system for material processing comprises multiple stage fiber amplifiers with rejection of propagating ASE buildup in and between the amplifier stages as well as elimination of SBS noise providing output powers in the range of about 10 μ J to about 100 μ J or more. The system is driven with a time varying drive signal from a modulated semiconductor laser signal source to produce an optical output allowing modification of the material while controlling its thermal sensitivity by varying pulse shapes or pulse widths supplied at a desire repetition rate via modulation of a semiconductor laser signal source to the system to precisely control the applied power application of the beam relative to the thermal sensitivity of the material to be processed. The high power fiber amplifier system has particular utility in high power applications requiring process treatment of surfaces, such as polymeric, organic, ceramic and metal surfaces, e.g., material processing, surface texturing, heat treatment, surface engraving, fine micro-machining, surface ablation, cutting, grooving, bump forming, coating, soldering, sealing, surface diffusion and surface conversion to a compound. A particular example is given for texturing of disk surfaces of magnetic disk media prior to the deposition or coating of a thin magnetic film on the textured surfaces to prevent slider stiction.

22 Claims, 6 Drawing Sheets

